SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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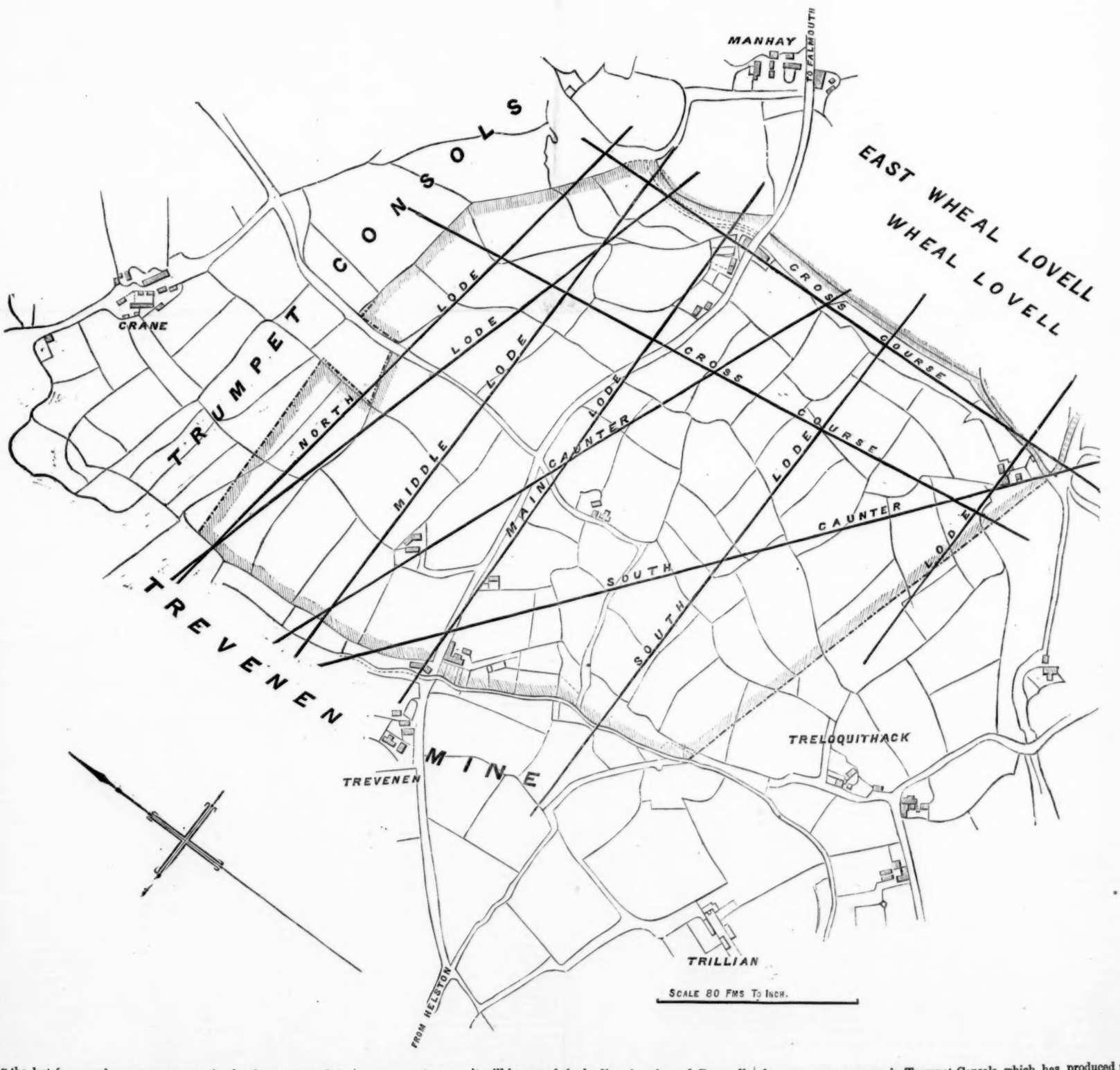
THE LOVELL MINING DISTRICT.



During the last few months very great attention has been attracted to this rich district, which was at one time second only to that of Wheal Vor in the production of tin. Within the last 12 months East Wheal Lovell has risen from about 3*l.* per share to as high as 23*l.*; and, although every effort has been made, both openly and privately, to depreciate the market value of the stock, the continued improvements in the mine have (even in the face of all these obstacles, added to a general depression of the market) prevented any considerable fall from the above price. The mine is now looking better than ever, and there is every probability that for many years to come it will be one of the leading tin mines of Cornwall. East Lovell, however, although now taking the lead in the district, is by no means the only rich mine in it, since it is on record that Wheal Lovell has produced more than 200,000*l.* worth of tin, and that Trevenen yielded in one year for dues alone more than 20,000*l.*, which, supposing the dues to be as high as 1-10th (1-15th being about the average of the county), would make the returns of tin from this mine in one year alone more than 200,000*l.* Lovell Consols is situate between Wheal Lovell and Trevenen, having the same lodes as those which have proved so rich in each of those mines. Immediately adjoining, and having parallel lodes intersected by the same cross-courses, is Trumpet Consols, which has produced tin to the value of 500,000*l.* sterling, and in the immediate neighbourhood of Wendron Consols and Basset and Grylls, the former of which has produced enormous quantities of tin, and the latter of which is a valuable and rapidly-improving mine. There cannot be a doubt that in such a district, with lodes which have been so productive wherever they have been tried, with cross-courses which have produced such favourable influences on parallel lodes immediately adjoining, that Lovell Consols is a speculation which may fairly be considered as second to none in Cornwall.

MINING IN AUSTRALASIA—MONTHLY SUMMARY.

[FROM OUR OWN CORRESPONDENT.]

ADELAIDE, April 27.—During the past month the progress of mining in the colony, at least as far as concerns the Wallaroo and Moonta Mines, has received a heavy blow and sore discouragement; the whole of the miners at these two great mines have been on strike since March 29. I would advise those of your readers who may desire to examine fully into the merits of the question at issue to read carefully all the reports in the *Register*, *Advertiser*, and *Telegraph*, or *Weekly Mail*, bearing on the subject. The leading articles in all the papers have been remarkably impartial, and the press justly regards the stoppage of these extensive mines as a national calamity. I will endeavour to give as concisely and impartially as possible a brief account of the strike. The agents in charge of the two mines are brothers, named Warmington, and previously to their obtaining the fortunate appointments which they hold were both, I believe, ordinary working miners. While they had plenty of "pick and gad" experience, they were devoid of scientific knowledge in mining matters. It is also said that their sudden elevation to positions of authority, added to tempers not of the most amiable kind, made them overbearing to the men. I believe there is no doubt that they have endeavoured to the best of their ability to work the mine profitably for their employers. Thus far, I believe, they have been good and faithful servants. But if the united testimony of several hundreds may be credited, and this backed by the statements of experienced practical men, there has been too great a disposition to grind down the wages of the miners for the sake of enriching their employers. It is also alleged that the mines might have been worked more profitably under different management, while, at the same time, the miners could have earner higher wages. The men complain that they have been stopped in the middle of their work, if there seemed a probability of the pitch turning out a "good take" for them. I give these statements without offering any opinion upon them, just to introduce the account of the strike. The district races were advertised for Easter Monday and Tuesday. Miners, at least in this colony, are very fond of seeing races, and at Wallaroo they applied for the usual holiday on the Monday, which was refused. Most of them, however, went to the races, and on Tuesday morning, when about to resume work, a number of them were discharged. This was the culmination of the grievances which had been accumulating for months, and all the miners immediately struck. They sent a respectful memorial to the board of directors, stating that they were unable to earn sufficient wages, and must have more; that they were not allowed subsist, and were only paid every two months; they also declared that they were subjected to incivility and harsh treatment by the agents, and, rather unwisely, demanded their removal, as they would not work under them. Their memorial was backed up by another from the storekeepers and tradespeople of the neighbourhood (Kadina), and which, after confirming the principal allegations of the miners at the Wallaroo Mines, respectfully requested that an enquiry might be instituted into the case. To this the directors replied that, "after considering the statements made, they had come reluctantly to the resolution of suspending the workings of the mines. The payment of the increased wages demanded by the miners now on strike would cause the mines to be carried on at a loss. These mines have been worked with great vigour, and by means of a large capital, for four years. During this period upwards of 450,000*l.* has been expended, the greater portion of which has been paid into the hands of the working classes for labour, while the proprietors to this moment have not received one farthing of benefit. Beyond this, as the miners now on strike decline to be employed under the present agents, the directors have inevitably come to the resolution announced. * * * The directors express their extreme regret that they cannot comply with the requests of the memorialists, believing that no sufficient grounds exist for complaints as to the rate of wages, and the directors are not prepared to entertain the question of the dismissal of their mining agents." The statement that the "proprietors have not received one farthing of benefit" from the Wallaroo Mines must be taken *cum grano salis*. As the Wallaroo Mines belong to a private proprietary I cannot say how much ore they have produced, or at what cost, but I think 20,000 tons in the four years would be within the mark, and it is generally believed that the profits on the ore have nearly, or quite, paid for the extensive smelting works at Wallaroo Bay, five miles from the mines, and which cost over 100,000*l.* If this view of the case be correct, it may be assumed that the 450,000*l.* expended in labour has been returned by the proceeds of the ore, and although the mine has paid no actual dividend, yet, if smelting works worth 100,000*l.* have been erected out of profits, or nearly so, and a mine worth at least 250,000*l.* remains in the hands of the proprietors, the assets of the mine are tolerably satisfactory, even without a dividend. The Wallaroo Mines are fully as productive in quantity as the Moonta, but the average produce of the ore is scarcely so high; the average of both might probably be increased by more careful dressing. But to revert to the strike. The directors hold out like men who can afford it, and the miners hold out, as men on strike will do, to their own serious loss and to that of their friends, the storekeepers, who have kept them supplied with necessaries. The miners, with their families, probably number 2000 souls, and, as in addition to these a population of about 3000 are dependent for their living chiefly on the working of the mines, the importance of the strike, even if it only last the month out, will be understood. The men allege that they cannot earn more than 20s. a week under existing arrangements. The captains and employers declare that the minimum rate of wages is 35s., and that far more can be earned if the men choose to work. The men demand 45s. a week (6s. to 7s. a day are labourers' wages at Wallaroo), and the removal of the agents before they will return to work. The directors decline to receive a deputation of the miners, or to institute any enquiries, unless the men first return to work. I have been thus particular in describing the circumstances of the strike, as it is the most important one, perhaps, that has ever occurred here; and, as these mines are well known in England, a concise and impartial account of the affair may be interesting to some readers of the Journal.

With reference to the productiveness of the mines, up to the commencement of the strike it was as great as ever; indeed, rather increasing. Other mines in the same district are also showing marked improvement. Of these the New Cornwall Mine exhibits the most; the returns of ore are still small, but are steadily increasing; and, under the skilful management of Captain East, the mine is paying expenses. A smelting furnace has recently been erected, and the commencement of operations in this direction has been very successful.

The Karkarilla and Yelta Mines, adjoining the Moonta on the south and north respectively, are also improving, the former especially; and, the lode having been found in the Yelta, it is hoped in a few fathoms sinking ore will be cut. From another part of the mine about 50 tons of good ore has been raised. The building of the great engine-house at the Matta is nearly finished, and probably in three months time this splendid mine will be again worked. I almost forgot to mention that the Moonta Mine has paid another dividend. The nineteenth annual report of the Burra Company (South Australian Mining Association) has just been published, and shows a very satisfactory state of affairs. The 53d dividend, amounting to 12,320*l.*, was paid last month, and another may be expected in a few weeks, for the sales of copper now on the way to England, and of ore available, is expected to leave a surplus of above 15,000*l.*, after meeting all liabilities.

The reports from the Yudanamutana and Blinman Mines continue highly favourable. The workings are going on with most satisfactory results; a considerable quantity of ore of a high percentage is at grass and *in transitu*, while a large accumulation of ore of lower quality is at the mines ready for smelting. At present only the ore containing above 25 per cent. of copper is sent down. This fact, taken in connection with the quantities shipped, speaks well for the richness of the mines. Many other mines in the far North might be profitably worked if a rail or tramroad were constructed from Port Augusta. There are, however, some very promising mines within a moderate distance of that port, and from which cartage is low.

ADELAIDE, APRIL 27.—In Copper very little business has been transacted, both the Wallaroo and Burra Companies having shipped largely on their own account. The present value is 104*l.* per ton. The arrivals of Coal from Newcastle, N.S.W., continue large; but although there is no change in price to note, yet sales are very difficult to effect. Galvanised iron (Morewood and Rogers's), corrugated, continues in fair request, but the market is affected by expected arrivals. Fencing wire has been in great demand, and prices have very much improved.

Mr. Stuart, the explorer, is about to return to Scotland, where he intends to reside for the future. With regard to a search for a gold field which Mr. Hargraves is now instituting, we believe that there is but little probability of success. The country has been examined to the south, and also for a distance of nearly 500 miles to the north of Adelaide. The most likely country met with has been in the neighbourhood of Balhannah, and along the course of the Onkaparinga; but the land in those places does not belong to the Government. We understand that Mr. Hargraves is not favourably impressed with the North, but he is determined to test the country carefully, and it is also his intention to pay a visit to the Port Lincoln district.—*Adelaide Observer.*

In the Moonta Mining Company half-yearly report the directors state that their affairs are in a satisfactory condition; for, although a smaller quantity of ore has been raised than in the previous half-year, the percentage of copper has been larger, and the market price has increased. The quantity of ore raised from Sept. 26, 1863, has been 5021 tons, of an average produce of about 19 per cent. The estimated value of this amounts to 60,252*l.*, or 12*l.* per ton; and the cost of raising is set down at 27,882*l.*, or 5*l.* 11s. per ton: leaving a profit of 32,370*l.*, or 6*l.* 9s. per ton. From these profits the directors have declared two dividends of 5*l.* each during the half-year. From the captain's report we learn that the mine generally never looked better than at present. The working establishment during the past half-year consisted of 9 officers, 205 miners, 21 mechanics, 108 labourers, 4 stablemen, and 67 boys, and at Adelaide 2 officers: making in all 416 persons. The weekly wages which have been paid are as follows:—Miners, 35s. to 40s.; mechanics, 40s. to 70s.; labourers, 30s. to 35s.; boys, 6s. to 24s.

THE GOLD FIELDS.—According to a return just laid before Parliament by the Minister of Mines, the total yield of gold for 1863 was 1,627,066 ozs., of which 1,133,367 ozs. were from the alluvial workings, and 493,499 ozs. from quartz; but these numbers must only be taken as an approximation to the truth, as in the first place there are no means of ascertaining what the actual total yield was, and the different mining surveyors have only imperfect data from which to prepare their estimates of the yields of the different districts. The proportion, however, between the yield from alluvial ground and from the reefs may be supposed to be nearly correct, so that considerably more than a fourth of the total yield of gold is now obtained from the latter. Whatever may be the case with regard to accounts furnished to the surveyors from the crushing-mills, it seems to be becoming more and more the fashion to withhold from the public information as to the yields from the different parcels of stone operated on. We are seldom told of the returns obtained even from the famous reefs at Wood's Point, though in one sense this is scarcely to be regretted, as mere speculation in that direction has been carried quite far enough, and if all the high yields obtained there were published people would be apt to forget that these fall to the lot of only a few of the many parties at work. Several new engines have, however, been erected on both sides of the central dividing range, and more are on their way up; so the investment of capital is helping materially to swell the produce of gold from these mountain regions, disappointed though some of the speculators may ultimately be. The usual number of new reefs and rich veins have been struck in the older districts, and a parcel of 6 tons from one of the latter, accidentally cut a few days since in an alluvial claim at Majorca, produced no less than 349 ozs. 18 dwts. of gold, or upwards of 58 ozs. to the ton. Great things were expected from a rich vein found some four weeks since at the water level in one of the reefs at St. Arnaud, as the first ton of stone from it produced 51 ozs. 17 dwts.; but all since raised has been comparatively poor, except 2 tons, the yield from which was 24 ozs. We have before mentioned the unexpected discovery of rich veins of stone on the Nuggetty Reef, at Tarrengower, and a lot 40 of tons from one of these since then produced 357 ozs. other parcels of stone also yielding nearly as high an average. This reef is remarkable for the fact that the richest stone found on it has been taken from immediately beneath, or from close alongside of, granite bars, with which it is intersected, contrary to the opinion of geologists that no gold is to be fonnd near granite. Little is now done on the once famous Inglewood reefs; but a lot of 103 tons, from the first claim taken up on a new reef lately opened there, produced 176 ozs. Among the good yields lately obtained from the Bendigo reefs two at least are worthy of special mention—one of 175 ozs. from 27 tons of stone out of a claim on Hustler's reef, and another of 240 ozs. from 40 tons. The highest yield reported from near Castlemaine was one of 102 ozs. from 35 tons of the mineral reef; and, according to the mining surveyor's report, there were 6407 tons of quartz from 30 different reefs in this neighbourhood, crushed during the first three months of the year, with a total yield of 4355 ozs. During the same period seven of the quartz-mining companies in the Ballarat district had 8257 tons of stone crushed, with a total yield of 1525 ozs.; and during that time the Port Phillip Company, at Clunes, crushed 9974 tons, with a yield of 4105 ozs. 17 dwts., much of this stone having been raised from a depth of 300 ft. Of the Ballarat deep lead companies the Koh-i-noor is still getting the most gold; but, as the expenses are heavy just now, its dividends are not invariably the largest. One fortnight the shareholders received 40*l.*, and the next fortnight 30*l.*; while the Great Extended Company was able to pay 28*l.* per share for the one fortnight, and 64*l.* per share for the other. Among the gold obtained by the latter company one week was a nugget weighing 61 ozs., and this and a piece found by the Cosmopolitan Company, and weighing 105 ozs., were the two heaviest nuggets found during the month. The last-named company paid 28*l.* and 22*l.* per share for the two periods, and, excepting the Buninyong Company, which paid 30*l.* per share for one fortnight, the dividends paid by the other companies were all below these.

LARGE YIELD OF GOLD.—The most gratifying news to be recorded this week is the almost fabulous richness of 6 tons of stone crushed by the Great Britain Company, on Gibraltar Hill, and adjoining the United Kingdom Company's claim, which yielded 349 ozs. 18 dwts., or over 58 ozs. per ton. The company is comprised of eight shareholders, who have raised the stone, with a quantity of a poorer quality now lying in their paddock, in less than a week. An instance of the fluctuating tendency of a gold-digger's luck is shown in the case of a shareholder in the above company, who only a few days ago could not persuade anyone to buy his share for 40*l.*, and now for one week's work he has obtained nearly 170*l.* The prosperity of this company is truly cheering; their claim is an alluvial one, and they came across what is termed a flat leader, which turned out so remarkably rich, and which will, we think, bear favourable comparison with the much-vaunted treasures of the famed Wood's Point. The much-coveted cake has been purchased at Mr. Samuel's branch office, at Majorca.—*Dicker's Mining Record* (*Melbourne*).

YUDANAMUTANA MINES.—Capt. Anthony, of the Blinman Mine, reports, under date April 15, that the stopes in the Nos. 1 and 2 shafts are yielding a fair quantity of good ore; also that the Blinman deposit, known as the Big Bunch, although sunk upon 17 fms., is still improving in depth, and that No. 4 shaft, at the 10 fathom level, is yielding large quantities of a high class ore. The first smelting-furnace has proved a succces, and another is in course of erection. Several tons of regulus of high percentage have been sent to Port Augusta for shipment. Capt. Terrell, of the Yudanamutana Mine, reports that in Henry's shaft the lode is now standing 1½ ft. wide, solid ore, of the best he has ever seen—black and red oxide; that in Mary's shaft there is a good lode at the bottom, bearing south towards the Big Boll, and that the stopes are yielding well. The engine-shaft is ready for the machinery, which is expected; in this shaft also there is a splendid lode of green and blue carbonate going down. There is now at Port Augusta, ready for shipment by *Sea Nymph*, about 200 tons of high class ore and 6 tons of rough copper, of about 90 per cent. On the whole, the shareholders in this company may congratulate themselves that their property is in a flourishing state. We are informed that as many as 30 or 40 miners have been dispatched to the Blinman and Yudanamutana Mines during the past fortnight.—*South Australian Advertiser*, April 27.

AUSTRALIAN MINES.

KAPUNDA.—The quantity of ores raised in February was 278 tons, of 19½ per cent. average produce, equal to 54½ tons of pure copper, exclusive of 60 tons of sulphur ores for flux. The quantity raised in March is estimated at about 300 tons wet weight, and of good percentage. Since the date of the last advices 75½ tons copper had been shipped per *Wellesley*, Port Philip to London.

ENGLISH AND AUSTRALIAN COPPER.—The quantity of coal at Kooringa was 2430 tons; at Kapunda, 1012 tons; and at the Port works and afloat, 1827 tons. There were nine furnaces at work at the Port—six smelting, one roasting, and two refining. Since the date of the last advices further shipments of about 91 tons of copper had been made to England.

YUDANAMUTANA COPPER.—The superintendent (Adelaide, April 25) says:—"I have arranged to ship, *via* Melbourne, the following quantities of ore—16 tons, 60 to 75 per cent. of copper; 63 tons, 40 per cent.; 19 tons, 37 to 40 per cent.; 76 tons, 27 per cent.; and 5 tons of rough copper. The vessel leaves Port Adelaide this week for Port Augusta, to load from the company's wharf." Capt. Anthony (April 15) reports:—"Yudanamutana Mine: The stopes leading to Mary's shaft have been yielding some very fine samples of rich grey ore; at present they are not looking so well as formerly, the ground getting harder, and the lode not so big. In Mary's shaft there is a good lode at bottom bearing south towards the big boll; there are several branches coming into this stope from the N.W. The levels north and south of this remain as before. In the engine-shaft there is a splendid lode going down 2 ft. wide, of first-class ore, green and blue carbonates; the ground being very favourable for sinking. A whim has been erected here; the water is, however, too quick to be kept under by horse-power.—Wheal Gleeson: Henry's shaft is down 20 fms. In the north end, driving towards the cross-course, very rich black ore has been cut; we have a whip at work night and day, but cannot keep the water under. From the north and south levels we have 15 fms. of backs to stope away of black ore.—Wheal Blinman: The stopes between Nos. 1 and 2 shafts are yielding a fair quantity of good ore. The 'big bunch' does not decline in depth, but rather improves; this is a wonderful deposit of ore, and will yet yield, if we make no further discovery, many hundreds of tons of ore. During the past month I have holed the 10 from No. 4 shaft to the chimney; it is yielding a fair quantity of ore of more than average quality. I have placed four men to stope in the north end of the 'big bunch,' from which I shall raise a large quantity of ore. In the smelting department we are not making such steady progress as I could wish. Our first smelter, although he did succeed in running out metal of great richness, did not succeed in making a 'bottom' capable of standing any length of time. We are now preparing a stone 'bottom.' I am exceedingly anxious about this matter, as it is apparent that with two furnaces in steady work we can return 400*l.* worth of copper per month."

GREAT NORTHERN COPPER.—Capt. Garland (April 15): We have sunk this month about 8 ft. The shaft is now down 13 fms. 2 ft. below the bottom level, and I expect to be able to sink about 7 ft. more by the end of this month, making the depth of the shaft from surface 37 fms. 3 ft. The ground in the shaft still continues much the same. We have met with a change of ground in the eastern end, but it is not making into the shaft so as to be of any advantage to us in sinking as yet. I would respectfully suggest that at the end of the month, as we shall be down within 3 ft. of the 15 fm. level proposed to be sunk, we should commence to drive to cut the lode.

PORT PHILLIP AND COLONIAL GOLD.—Mr. Bland (Clunes, April 22) writes:—Quartz Crushing: During the month of March (six weeks) we crushed 4934 tons of quartz, which yielded 1751 ozs. 16¼ dwts. of gold. The receipts for the month amounted to 2220*l.* 19s. 10d.; payments ordinary, 1626*l.* 19s. 2d.; stock firewood balance, 600*l.*—2226*l.* 19s. 2d.; profit, 994*l.* 8s. The receipts include 188*l.* 1s. 2d. repayment of expenses working the Chilian mill and arrastre, and 159*l.* 16s. 6d. our share of the profits of the proceeds of gold obtained in this way. The payments include a good many extra items, such as balance contract for stock firewood, purchase of quicksilver, &c. During the past month we have been but partially supplied with quartz, and the machinery has only crushed on an average 822 tons a week, while the plant is quite capable of crushing 1200 tons. Under these circumstances, and until better supplied, I have discharged some of the hands, and commence this month to work by day only, beginning at 6 A.M., and working one 12 hours' shift. The men receive the same pay as they did for eight hours. During the last fortnight, working in this way, we crushed with the old plant 1268 tons; and to make up for the deficiency I propose to work the stamps one or more nights in the week, according as we may be supplied with the quartz. Whilst this state of things lasts we shall clean up fortnightly instead of weekly.—Machinery: This is all in good working order. Remittance in payment of invoices of stores shipped, 184*l.* 0s. 6d. I much regret not having it in my power to remit any funds by this mail on account of dividends, but the share of proceeds of gold coming to this company for the last fortnight only amounted to 662*l.*, and the balance in the Union Bank is but 265*l.*, a sum not worth while to remit. I hope, however, to be able to do better next month. Mr. Munday's report on the state of the Clunes Mine has been received—"In looking at the mine, as a whole, there seems every reason to expect that under good management it will continue to yield prosperously for a long period. A great deal of ground has already been laid open, and the veins continue strong, and show evidence of being auriferous in depth. East and west of the veins now worked upon there are good reasons to believe that other quartz reefs are in existence, and it is a matter of much importance that the eastern and western ground should be explored by the extension of cross-cuts from one of the levels at the northern shaft beyond their present limits. The late low yield does not seem to be attributable to any general falling off in the quality of the veins, but from the fact of the stopes in operation having fallen on poor ground, and from advantage not being taken, as at other periods, to extract mineral from the richer portions of the veins to make up the deficiency. On stoping being resumed on the eastern vein, and on some other ground which was brought under my notice, the yield will, without doubt, considerably improve."

WORTHING.—Ore raised in the month 210 tons, of the usual average quality. Regulus made in like period 51 tons. We have also on hand 100 tons of regulus and 500 tons of ore. The expenditure of the month has been 1627*l.* 13s. 6d. The 53 south end lode has much enlarged between the 43 and 53 fm. levels, and great quantities of ore can be taken away. Malleable and red oxide of copper has been cut in Tonkin's shaft, on Boundy's lode, and in addition the remainder of the lode, consisting of green and blue carbonates of copper, will pay well for working. The quantity of ore in sight is immense, and much exceeds in quantity their previous calculations.

BON ACCORD AND YORKE PENINSULA.—Referring to the Kurilla Mine, which, in addition to all the assets of the Bon Accord, has been acquired on a royalty by the Yorke Peninsula Mining Company, the Chairman of the committee of management observes that it "has always been considered a valuable property, and, as far as worked, has proved itself so. The real origin of its suspension and sale by the original proprietors was that the first vendors, after receiving 2000*l.* in cash, retained one moiety of the mine in free shares, so that the other shareholders had to find all the funds for working. I hope, however, that the company which will take the place of the Bon Accord Company may accept the offer made them; once established on the Peninsula, other good openings will likely offer.

FORTUNE COPPER (Western Australia).—Captain Penberthy (Fremantle, April 25) reports:—In the 40 fm. level, south-west end, the lode is 3 feet wide, 6 in. of which is a good branch of copper ore; it is now producing ⅛ ton per fathom, of good quality, and has greatly improved during the last few days both in value and appearance; the stope in the back of this end is producing 3 tons of copper ore per fathom. In the 40 fathom level, north-east end, the lode is small, and at present unproductive, but there is a good channel of ground for exploring; the stope in the back of this end is producing 2 tons of copper ore per fathom, of good quality. The 30, on the north lode, is driving south-west of shaft; the lode is 18 in. wide, producing ⅛ ton of copper ore per fathom; it has greatly improved during the last week, and I consider it a fine point of promise in our operations. In the stope in the bottom of the 20 the lode is 3 feet wide, producing 3 tons of copper and lead ore per fathom. The sinking of the new engine-shaft is progressing very favourably, and I expect in two months from date it will be holed to the 40 fm. level. We have dressed this month 35 tons of lead ore and 30 tons of copper ore.

SCOTTISH AUSTRALIAN.—During the month there were sampled 145 tons of copper ore, being equal to 15¾ tons of fine copper.—Smelting Works: 17¼ tons of copper have been shipped to London—a further quantity of 7 tons per *Rifleman*, and 16¼ tons per *Liberator*, and there remained at the works 13 tons of fine copper on the point of being forwarded to Sydney for shipment to London. There were 477 tons of copper ores on hand at the smelting works available for smelting purposes.—Lambton Colliery: The raising and shipment of coal was progressing favourably, the quality continued as good as ever, and the superintendent reports that as regards the present low price communications were going on amongst the colliery owners with a view to raising it. The Panama, New Zealand, and Australian Royal Mail Company, amongst others, were coaling their vessels with this company's coal. The following is a copy of the report of the chief engineer of the steamer *Prince Alfred* to the general manager of that company on the Lambton coal used in that vessel:—"They are very clean coal, making a small amount of clinker and ashes; they are fully equal to the Wallsend coals in their steaming qualities, and I think, on the whole, are the best coals I have tried in the colonies."

WHEAL ELLEN.—Capt. Barker (April 27) writes—Squarey's engine-shaft measured on survey-day 1 fm. 1 ft., and is now 5 fms. below the 30 fm. level; the lode still remains in the eastern or hanging wall side of the shaft, consequently our progress is much slower than I could wish. The 40 fm. level end, north of Scott's shaft, measured 1 fm. 1 ft., and is now being driven under the engine-shaft, the yield varying from 1½ to 3 tons per fathom; the lode, from the present appearance, promising to widen immediately below the 40, as it is about 8 in. wide in the back of the level, and 12 to 14 inches in the bottom. The water in Basset's shaft is now in fork to the bottom of the 40, and I hope our difficulties there are over, having had a large pool of water draining from the stopes. The ground being whole below the 40 we shall only have the bare shaft to fork, and as I am given to understand it is in very good order below the 40, I have no doubt we shall make rapid progress. We have forwarded 50 cwts. of calcined ore to the Bremer Mines, to be operated on by Rhode's process. [The company have advices of a small shipment of lead, the assay of which gives 298 ozs. of silver to the ton.]

GOLD MINING IN VICTORIA—No. II.

BY PHILIP A. EAGLE.

AVERAGE EARNINGS OF MINERS—IMPROVED SYSTEM OF WORKING—WET AND DRY LEADS—POOR GROUND "PAYABLE" TO WORK—SLUICING—HYDRAULIC OPERATIONS—REMARKS.

Notwithstanding the marked decline in the produce of the gold fields, the amount of yield in proportion to the number of persons engaged in mining is little inferior to the experience of some half dozen years back; it follows, therefore, that the miner of the present day is better remunerated than his predecessor.* How far this theory will hold good can only be determined by comparing the yields of the two periods with their respective populations.

The maximum of the mining population for 1863 is placed in round numbers at 93,000,—70,000 Europeans and 23,000 Chinese; but as all Chinese upon the gold fields are classed under the head of "miners," it will be necessary to strike off at least an eighth of this number as persons who are engaged in other pursuits, leaving the actual mining class at (say) 20,000. Rating their individual earnings at four pennyweights per week, or about 40*l.* per year (which I think fully represents the fact), they will absorb about 800,000*l.* of the annual produce, leaving 5,737,508*l.* to the credit of the European side. Now, as a large quantity of gold is still taken away by private hand, converted into manufactures, and otherwise escapes the Customs, amounting in all to (say) one-twentieth of that upon which the export duty is paid, the aggregate earnings of the European miners may reasonably be estimated at 6,024,383*l.* Of this class, returned as "mining population," it is calculated that fully 5 per cent. are non-producers, leaving the number of actual miners at 65,100, whose yearly earnings would amount to 92½*l.*, or better than 23 ozs. of gold per man, equivalent to 34 ozs. obtained in—taking the divisional year—1857. An immense impetus has of late been given to mining enterprise, and to the development of the colony. The system of co-operation has proved eminently successful, and the amalgamation of small parties of working miners is steadily progressing on most of the principal fields. More systematic, effective, and economical methods of working have replaced the former superficial and unskilful process; legislation has also made liberal concessions to the mining interest; permanent reservoirs have been constructed throughout the different districts, the imposts have been reduced, the mining laws amended, and the area of claims enlarged.

Some of the "amalgamated companies," which possess considerable capital, are occupied principally in working the "deep leads," which are most numerous on the western and south-western fields, and though, from the nature of these operations, considerable time and expense are involved, they have in most cases proved highly remunerative. At Ballarat alluvial mining is conducted profitably at a depth of over 500 feet,† after penetrating, probably, 250 feet of basalt and 150 feet of the primitive rock.

Other companies embrace a wider range of operations. Large tracts of ground on abandoned diggings are leased, and the whole of the alluvial is cut through and re-washed. In some places the gold is found finely distributed over large areas; and ground which a few years back would have proved unprofitable to work, is now made to yield a remuneration varying from 3*l.* to 15*l.* per man per week, and even larger returns are obtained in localities possessing considerable water power available for puddling and sluicing operations. In the Ovens district, in Gippa Land, and on the Goulbourn and Lodden Rivers, extensive washing operations are carried on.‡ In some instances the ground is washed from the surface to the bottom, a depth of perhaps 30 feet, and the economy of the method adopted is shown by the fact that earth containing but six or seven grains to the cubic yard will yield a remuneration of 10s. and 11s. per head per day.

To those unacquainted with the system of reducing large quantities of auriferous earth, the following illustration of the process in vogue at one of the creek diggings (Talbot) may prove interesting. In this instance, however, the motive power is obtained from a reservoir constructed for the use of the miners, by private speculation, and which receives the drainage of 100 miles of country. A feeding dam is excavated about a third of a mile from the principal scene of operations (Kangaroo Gully), which is supplied by a race cut from the reservoir. Another race is cut from the dam to the top of a hill, from whence the water is conducted along a flume to the height of about 30 feet above the workings. From the point of the flume a pipe is carried perpendicularly to within a few feet of the ground, and from this pipe another pipe (this time made of canvas, to secure flexibility) is laid down to within a few feet of the earth to be removed. Previously a large cutting, about 18 feet in width, was carried across the gully, and thus, having secured a good face in one direction, a "tail race," half a mile in length, was cut through the old ground on the opposite side, in order to secure the complete running off of the water, and thus prevent an inundation of the works by a reflux of the element. At the end of the canvas hose a nozzle, about 3 feet in length, is fixed for the water to pass through, and this nozzel is directed by one man against the earth to be removed. Some idea of the force with which the water strikes the earth may be gathered from the statement that 700 gallons of water is delivered every minute, and that about the same time suffices to displace avalanches of gigantic size. The director of the nozzel first undermines a part of the face, perhaps 15 feet in length. A short time suffices to create a gutter about 1 foot or 18 inches wide, which is followed by the displacement of all the earth above, up to the surface, a distance of about 12 feet. This comes tumbling down in front of the operator, who, by spasmodic jerks of the nozzel, washes the lumps into fine sand in the short space of a few minutes. The gold deposits itself on the bed rock, but the debris is carried off by the force of the water into sluice-boxes which are laid down in the tail race. About 100 feet from the commencement of these boxes two men are engaged in clearing away the stones and sand, thus preventing the boxes from being choked by the stuff which is continually being carried along them by the water. After washing 7000 or 8000 loads of dirt, at the rate of 1000 loads per week (the working time being about 10 hours a day), the water is turned off, and the surface of the bed rock dug up for a few inches. The stuff is collected into a heap, and worked by the hydraulic process into the sluice boxes, the first of which, being perforated, catches all the gold. A

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* The difference in the exchangeable value of the earnings of the miner of the respective periods named would be about 50 per cent.

† There are 36 companies (alluvial) in Ballarat district, with shares amounting in all to 683,886*l.*, and which have laid out in machinery and buildings constituting the plant, but without calculating the expenditure for labour in the mines, 106,399*l.* The plant of the Koh-i-noor Company cost 12,000*l.*, and their shares are worth 100,000*l.*, or 2500*l.* each; that of the great Extended cost 9000*l.*, and the shares are worth 144,000*l.*, or 1800*l.* each. The Albion shares are valued at 1600*l.* each, or 100,000*l.* in all. The plant of the Royal Saxon Company also cost 12,000*l.*, and their shares are worth 32,000*l.*, or 800*l.* each; and so on down to the little companies with shares of 5*l.* and a proportionately small outlay in machinery. A recent "washing up" of a fortnight's labour at the works of the Great Extended Company yielded 2166 ozs. of gold, valued at 8718*l.* odd.

‡ There are altogether upwards of 360 steam-engines (having a combined horse-power of 6380) engaged in alluvial operations on the gold fields, besides 4160 puddling-machines, 500 whims and pulleys, 800 sluices and toms, 400 water-wheels, and 31 hydraulic hose.

few days are sufficient for the clearing-up part of the arrangements, when the water is again turned on, and operations commence afresh.

Of the profits of this scheme, it may be stated that material that will average a quarter of a pennyweight to the load will pay handsomely.

As much as a thousand loads can be thus washed in a week by four or five men, but upon the completion of a plan for carrying off the tailings without the employment of manual labour, a much larger quantity of earth can be removed and washed by the same number. As it is, after paying for the water, Reid and Co's party netted over 3*l.* per week, each man, at the first washing up, a few months back.

The great value of some such scheme as the hydraulic process, when applied to operations on what are known as dry diggings, will be better understood from the statement that in the Maryborough district (and possibly in others) nearly the whole of the ground will pay to wash in this manner.*

The extent of ground that is supposed to be auriferous (exclusive of Gipps Land) has been estimated at 20,000 square miles. The portions of this ground already mined upon, or so returned by the mining surveyors, cover a total area of less than 800 square miles, of which probably not more than 150 or 200 square miles have been actually wrought. Even but a small proportion of this can be considered as entirely exhausted. Recent explorations prove beyond a doubt that a rich gold field exists at Wood's Point and Jamison, on the Upper Goulbourn, far more extensive than any yet known, and daily discoveries are being made, which assure us that a very large portion of the Gipps Land range of mountains is abundantly if not equally auriferous.

Looking at the renewed activity throughout the established mining districts, and the steady accession of fresh and valuable ground, there is good reason to believe that for many years to come gold will be the great staple of Victoria.

(To be continued.)

* The amount of labour expended on alluvial mining presents the most astonishing results. Whole hills, often of considerable dimensions, and covering, perhaps, several acres of ground, have been carted away and washed, and in other cases have been left supported on blocks of timber. The very features of the country are effaced, and what were once known as gullies, hills, and flats, covered with endless heaps of pipe-clay, lose every trace of their original character under the successive manipulations of Europeans and Chinese.

ON STEAM-BOILER EXPLOSIONS.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I have only recently had the opportunity of perusing Mr. Zerah Colburn's pamphlet upon "Steam-Boiler Explosions," published some time since, and I now take the opportunity of forwarding a few extracts from various sources, to prove the relative amount of honour due to your old correspondent, Mr. Thos. Craddock, and to the author of the pamphlet in question. They will also serve the same purpose in relation to Mr. Clark's claim, made in the "Mechanic's Magazine" of Feb. 9, 1860. These extracts show how the point has been insisted upon that there exists that which Mr. Craddock calls the explosive compound, and how it has been proved that in practice this heat and water is transformed with nearly the rapidity of lightening from its passive state into the most dangerous element when massed together, as it is in our steam-boilers. These extracts show that this exists in its mildest form in the starting of the engine, and in its most energetic form in conjunction with over-heated plates; between these two extremes all yielding of the boiler must commence. By them the expansive and the impulsive force of heat and water thus combined is clearly set forth as adequate to the most destructive effects produced in the worst boiler explosions. In these the immense range of destruction is clearly set forth by directing attention to the enormous volume of steam which results from the heat and water in its expansive and impulsive action. A glance at the dates and titles of the works referred to will show how long and wide have been the circulation of the views there recorded:—

MINING JOURNAL, 1844, page 379.—"If we enquire into the effect which surface has in transmitting heat to the water, also the small space required to bring a great extent of surface into immediate contact with the heat produced in the furnace which tubes present, and to the more rapid transmission of such heat through the thinner metal of which the tubes are composed, compared with the thicker metal of the common boiler, our surprise is not that tubular boilers are now coming into use, but that their use should have been so long delayed. If we consider the hydrostatic law which relates to the pressure of fluids acting on the interior of the vessel containing them—if, moreover, contemplating the effects of a large vessel, such as the common boiler, containing many hogsheads of boiling water, impregnated with an elastic vapour, which gives to the whole mass that fearful explosive property by which thousands of human lives have been sacrificed—I think, if we fairly consider that the force tending to burst a boiler is as the pressure multiplied into the surface on which it acts, and on the effects of such a mass of expansive fluid instantly liberated, we must wonder that tubular boilers have not ere this done much towards remedying this, the worst evil attending the steam-engine. That tubular boilers, if strictly such, will effect this, and much more, follows as a necessary consequence."

Here the reader's attention must be directed to an able article in the *Mining Journal* of June 28, 1845, p. 323, which originally appeared in the *Manchester Guardian* of the previous Wednesday, on the then recent boiler explosion at Patricroft, and which led to a thorough investigation of the subject, for which see the *Mining Journal* of 1845, p. 335, and 1846, p. 119; Craddock's "Lectures," pp. 36 to 40; *Bradshaw's Railway Gazette*, Feb. 28, 1846, p. 479, and Craddock's "Lectures on the Chemistry of the Steam-engine," published by Simpkin, Marshall, and Co., 1846. From either of these sources the reader can satisfy himself as to the details of what, from its length, we can only give the substance of here.

The writer in the *Manchester Guardian* correctly inferred that the intense fire generally acting under steam boilers would, if the plates or flue of the boiler were dry, raise the heat in them to redness in five minutes, but insisted that five minutes would do little towards raising the pressure of the steam from 45 lbs., the working pressure, to even 70 lbs. per square inch. But the reader will see it pointed out by Mr. Craddock, in the work referred to, that not only 70 lbs., but near 300 lbs. pressure per square inch is the correct estimate of the effects of such a cause, as premised by the writer in the *Guardian*, and that its development would not require more time than 36 seconds, much less five minutes. That the notions upon the subject prior to this were foggy, is proved by the writer in the *Guardian*, and an examination of all that was published before that date will also confirm it.

MINING JOURNAL, March 7, 1846, p. 98; BRADSHAW'S RAILWAY GAZETTE, Feb. 18, 1846, p. 379; CRADDOCK'S LECTURES, p. 22.—After an illustration of the force upon a 4-ft. cylindrical boiler, and a 3-in tube, which should represent the strain upon the former as 16 times what it would be upon the latter, supposing the pressure the same in both, occurs the following:—"Is it objected that my instancing the accidental high pressure of 200 lbs. is not a fair mode of putting the question? My answer is, that it is against such contingencies, or accidental circumstances, that men, in all their combinations and contrivances, should be on their guard; for from such contingencies arise the most destructive and deplorable accidents. But this is scarcely the worst effect our common boilers are likely to produce; for as they contain a great quantity of water, this water when impregnated with heat, as in the steam-boiler, becomes an immense magazine of explosive matter, which on the bursting of the boiler is instantly set at liberty, producing death and destruction around. * * * It will be seen that in the tubular boiler a greater area than the tube itself cannot exist for the escape of the explosive matter; so also will it take a circumscribed and definite direction: whereas, upon the bursting of the large shell of the common boiler, an amount of explosive matter, many times greater than that which the tubular boiler will contain, is instantly scattered in all directions, life and property alike sharing the consequences."

MECHANIC'S MAGAZINE, Aug. 21, 1847, p. 172; CRADDOCK'S LECTURES, p. 92.—"One can scarcely forbear to smile at the complacency with which even 1000 lbs. pressure is proposed and received by the public, when that pressure is the result of compressed air. Yet I must confess myself unable to see the grounds of complacency in this case, and fear in the case in which I propose a comparatively very low pressure for steam; as the air, under such circumstances, is certainly the more dangerous of the two, as when the water from which the steam is generated is contained in tubes, as explained in these Lectures, the danger from the water, under such circumstances, may be said to be completely prevented; while steam partakes of no property more dangerous than compressed air. But here will occur to some the danger from the heat of the steam; but it deserves to be generally known that the higher the pressure of the steam previous to its rushing from a vessel, the lower becomes its temperature by its expansive force, and the mere heat of the steam, under such circumstances, is completely harmless."

MINING JOURNAL, 1848, p. 619.—Out of seven questions put by Mr. Craddock to those who privately denied the soundness and value of his views, we extract the three following:—"Will they, or will they not, grant me that all explosive mixtures are dangerous in proportion to their volume at given pressures, and to the instantaneousness of their liberation, which in the steam-boiler is effected by the almost instantaneous rending of the shell of the boiler? Will they, or will they not, grant me that the most dangerous effects from common boiler explosions are due to the great amount of sensible heat contained in so large a quantity of water, when under pressure, as that in the common boiler? Will they, or will they not, grant me that it is this heat pervading the whole mass of water, which on the boiler rending asunder produces instantaneously throughout the whole mass an immense volume of steam, and, consequently, is the cause of the most destructive effects? I tell them that they must grant me these conclusions, because there is no wriggling out of them, for the physical laws are stubborn opponents."

From a paper supplied and read by Mr. Craddock at the April, 1848, meeting of the Mechanical Engineers, Birmingham, and published in the Proceedings of the Society, also in the *Mining Journal* of 1848, p. 214, we extract the following:—"The laws relating to latent and sensible heat, when considered in combination with large volumes of water, and subjected to the casualities attending the steam-engine, suggest the diminishing the quantity of water necessary in steam-boilers, as far as practical circumstances will permit, as one of the surest means of preventing destructive boiler explosions. The importance which attaches to the suggestions which these laws present becomes apparent when we consider the effects, in case of explosion, which such an amount of sensible heat produces as that contained in the large volume of water necessitated in boilers of 60-horse power, for instance, and of the usual construction; as the sensible heat contained in so large a volume of water, supposing the pressure of the steam to diminish from 40 lbs. to 20 lbs. per square inch, will generate a volume of steam at 20 lbs. per square inch, equal to 30,000 cubic feet. Here we have a cause equivalent to the diffusive and destructive effects exhibited in common and large boiler explosions."

MINING JOURNAL, April 15, 1848, p. 186.—Treating upon the locomotive capacity of war ships as a defence of our coasts, and directing attention to the unsuitability of the boilers and engines of the common kind, he says:—"The enemy, relying upon such a system, would be brought to a dead stand for want of motive power, or from the immense boilers necessitated on such a system, and containing, as they do, the enormous amount of explosive matter, standing so far above the water line, liable at every moment, by the enemy's shot, to be converted into the most destructive magazine for the spreading desolation and dismay through the whole crew, if not sinking the ship."

MINING JOURNAL, 1850, p. 46.—"Let us suppose that in a 4-ft. boiler the steam should get to 200 lbs., and the same pressure in mine; then we have about 29,000 lbs. rending force upon the safe low pressure system, and only about 1800 lbs. upon boilers as I construct them. Although this pressure question is the one upon which the misleading pander so much to the prejudices of the public, the most dangerous thing connected with steam-boiler explosions they leave entirely out of sight—which is the immense quantity of explosive matter their much-lauded boilers contain, and the instantaneous diffusiveness of its liberation when such boilers burst. Herein lies the true cause of those awful accidents, which blow the vessels to atoms, and send numbers of human beings into eternity before they have time to look around them."

ENGINEER, Dec. 1857, p. 477.—"If 'Omnibus' be really anxious to put an end to the shocking destruction to life and property which is being continually occasioned by boiler explosions, and if he be a practical and scientific man, and will allow the evidence which both practical and abstract science unite in presenting to have their due share in the formation of a sound judgment as to the means best calculated to attain so desirable an object, he will soon discover that the way to do it is to diminish in a tenfold degree the amount of explosive matter which boilers of the present construction require for a given power; and then so to subdivide the remaining amount by means of strictly tubular boilers, so that the greatest pressure which temperature will allow us to apply in and through the steam-engine may be generated in such boilers with safety."

ENGINEER, March, 1855, p. 189.—"I remind 'Omnibus,' and others, that the common marine boiler contains 48 tons of water, and my boiler 3½ tons. Imagine a shot taking away a plate of the common boiler, and a tube of mine: you have 48 tons of explosive matter in the common boiler, and 3½ tons only in mine. The common boiler stands 12 ft. high, and mine only 8 ft. But, beyond this, my boiler admits without detriment to be subdivided into a half-a-dozen, or even more if required. These views, to me, seem suggestive of very important consequences in case of war."

ARTIZAN, Aug., 1859, p. 203.—"No person possessed of sound abstract views and practical knowledge of steam and its development, when under such circumstances as exist in our present marine steam-boilers, but must have misgivings as to the consequences of shot upon them, containing, as they do, from 40 to 60 tons of an explosive compound. This compound a cannon ball may at any moment set at liberty, to the assistance of the enemy, in the destruction and confusion of the crew; leaving the ship when the steam is most required destitute of its aid, and the crew bewildered and disabled by a mass of such matter rushing through and over every part of the vessel."

The foregoing, extending over 15 years, shows a little of what Mr. Craddock communicated to the public upon the subject under notice, long before Mr. Z. Colburn or Mr. Clark wrote a word upon it. We also see what an Englishman, who desired to understand what Mr. Craddock had written and done, says in reference to the information it conveyed to his mind:—

MINING JOURNAL, 1851, p. 578.—Mr. David Mushet says: "The *bulk* of the explosive magazine is a far more momentous source of danger than the intensity of the particles of the included agent. The system of disarming the enemy by cutting him up in detail has made great advances; and there is no reason to doubt but the day is fast approaching when the enormous artillery, the egregious concentration of destruction, which, diminished though they are of danger, still remain the too fatal attendants of steam machinery, and alarm us almost weekly by constant calamities, will be eventually reduced to safe and manageable dimensions."

MINING JOURNAL, 1852, p. 219.—Mr. Mushet, writing upon the case of 4-ft. cylindrical boiler and 120 lbs. pressure, as on the railway, puts it thus: "The explosive matter confined in the area of this section 48 × 48=2304 circular inches × 120 lbs. per inch= 276,480 lbs., or reducing to square inches about 80 tons. This is the force of the explosive matter which will be scattered about, in the event of an accident, for every inch of the length of the boiler, amounting, if the boiler be 20 ft. long, exclusive of the ends, to 19,200 tons. Yet railway engineers are not afraid to drive such engines, neither are the public afraid to travel behind them. No one even thinks of danger, except when occasionally, as occurred two months since, a whole station is blown away by an explosion."

MINING JOURNAL, August 19, 1854, p. 547.—Mr. Mushet writes as follows: "It is universally known that explosions occur at the very moment when, if the principles of the safety-valve were sound, they ought not to occur—that is, after the starting of the engine, just at the time when what ought upon that principle to be the great safety-valve—namely, the demand of the cylinder for steam—has been opened; this copious safety-valve is in action, and the catastrophe ensues. The *rationale* of such a paradox is undoubtedly to be found in the increased impulse imparted to the steam by allowing its intrinsic powers of expansion to act, a grand source of destruction, so long since pointed out by Mr. Craddock in his 'Lectures on the Chemistry of the Steam-Engine.' The 'liquid steam,' as Mr. Dircks* appropriately designates the water got under intense pressure, contains, *in se*, the elements of enormous force, ready to develope themselves the moment the restraining pressure is lowered, and the equilibrium of heat through the whole bulk destroyed. The effect of increasing pressure in a boiler is to reduce the two included elements more and more nearly to an homogeneous condition. The steam is constantly approaching the density of a liquid, and the water as constantly approaches the rarity of a fluid, the dense steam is interspersed throughout the water, and, as is shown by facts commonly occurring in steam-boilers, the specific gravity of the water comparatively annihilated. Now, a body of steam itself, in a dense state, independent of the accompanying water, contains a fearful rending power when play is given to its action. Its included heat is the source of vast momentary expansion on the least liberation from pressure, and the powerful rending effect of such liberty is well known to those who are familiar with the management of explosives. But, in aggravation of this effect of the steam, we have to add the effect of the other included element—the water. This is likewise ready to add a vast increase to the aeriform volume, the moment the reduction of pressure, by escape, lowers by so many degrees the standard of evolving temperature, and permits the water to discharge those degrees of heat in evaporation, down to the temperature due to the diminished pressure. The effect of a sudden abstraction of steam from an over-heated boiler, with the corresponding reduction in the heat of the escaping steam, is, in fact, tantamount to applying an equal increase of temperature to the boiler and its *whole* contents. If the steam escaping is thereby lowered (say) 50° below the point at which it previously stood, the equilibrium is gone, and the *generative power of the whole contents of the boiler*, and of the boiler surface, is instantaneously raised by as many degrees. Hence the escape of steam aggravates instead of diminishes danger. We know that in water spaces of small diameter steam occasionally annihilates the specific gravity of water, precisely as air without any pressure will resist gravity in capillary tubes; and it is a fair analogy to presume that in some degree, even in large boilers, the same kind of suspension is more than probable when subjected to the accidents of irregular excess of pressure. In a large boiler with dense steam interspersed through the whole of the water, and the elastic fluid being more especially evolving from those portions of almost weightless water which are nearest to the boiler surface, we can conceive the whole under surface of the water to become suspended from an actual contact with the heated plates. Upon the first opening action for escape, whether at the safety-valve, or to the engine, *or otherwise*, there will be a tendency of the whole bulk of contents to rise up towards the direction of the escape."

The reader can now compare what is set down above, and, as is seen, has been before the world for years, with what constitutes the subject of Mr. Colburn's pamphlet.

MINING JOURNAL, July 23, 1853, p. 443.—Mr. David Mushet writes: "I readily admit it is not the age of profundity or accuracy. What we call our best authors are the gold-beaters of literature, who leather out a grain of sense over several hundred lacquered pages. The time will come when Mr. Craddock will be thus hashed up." Be it so, yet he that provides the gold may surely be acknowledged as having done so.

In looking into Mr. Craddock's actual doings as an inventor, in connection with the steam-engine, we find he adds his condenser; he condenses the steam by the atmosphere where water is not obtainable, producing the vacuum by air condensation, and he retains the steam water for the use of the boiler. He not only combines, but he very greatly extends, all the property-making elements found in the Watt, the Trevithick, and the Cornish types of the steam-engine, as his condenser reduces the water requisite per horse-power per day, from 1960 gallons in the Watt, 450 gallons in the Cornish, and 100 gallons in the Trevithick, to 1 gallon in the Craddock. His boiler is adapted to produce steam with safety and very great economy, at any pressure from 50 lbs. the Cornish, or what, in 1843, was the locomotive pressure, up to 400 lbs. His steam-valves alone have seldom been surpassed by any inventor; by them the steam, on entering the cylinder, is cut off at any part of the stroke, from 1-60th to ½. His engines in everyday work demonstrated, in 1843, a reduction of coal per horse per hour from 8 lbs. in the Watt and Trevithick types, to 3 lbs. in the Craddock; and in 1858, from 4 lbs. in the former to 1 lb. in the latter. Craddock, by dispensing with the injection, and all the ponderous mechanism of the Cornish and Watt engine, and substituting, as he has, a suitable direct-acting engine, the practical improvements he has added thereto, have been the subject of numerous patents, since he supplied them. By his detecting the cause of the condensation in the cylinder with high-pressure steam, used expansively in vacuum steam-engines, and neutralising its coal-destroying effects in such engines, so as to bring out, since 1845, in the work done so much of the whole theoretic property value of high-pressure expansive steam as to be beyond what was then considered possible with such an engine. As no engine but the ponderous Cornish pumping-engine had arrived at anything like such results from the expansive use of steam, Mr. Craddock's perfected engines realise nearly all the theoretic value stated in his lectures in 1846; whilst by his boiler nearly all the calorific effect in the fuel is imparted to the water in the boiler, and 13½ lbs. of steam generated with 1 lb. of coal. If this invention, so safe with high-pressure steam, so utile, portable, economic, and universally applicable, is not, on comparison with that of Savery, Newcomen, Watt, or Trevithick, equal to any one of them in the increased property value it has added to the steam-engine, it must be because they are more ancient, and their authors better treated, as only on these two points is the comparison adverse to Craddock.

There can no longer be any doubt but Mr. Craddock's claim in his invention consists in the following method of generating, working, and condensing steam, and is set forth in his practice, drawings, specifications, and his writings, which show it to consist in generating the steam under high pressure, using it expansively by direct acting engines, neutralising the cooling effects produced by the hot and cold steam on the interior of the cylinder, and on the piston, so as to prevent the condensation of the impelling steam until discharged to the condenser; condensing the steam by surface condensers, cooled by water where it is obtainable, and in other cases cooled by the atmosphere, and retaining the steam water for the use of the boiler. His air condensation being an entirely new source of power, added to the property-making elements, which were first converted into property by Savery and Newcomen, Mr. Craddock, in his engines, specifications, and writings has demonstrated in so many ways how practically to realise an additional property value by this invention in the steam-engine, that those who examine the matter will cease to doubt the general correctness of his tables, published in 1847. The gain in property value to England is there stated in detail, under the heads of marine engines, locomotive engines, and stationary engines, and the *total set at twenty millions sterling annually*. To do Mr. Craddock justice, it must be borne in mind that *all this* has been published to the world ever since 1847; and that without the use of, more or less, of what he was the first not only to point out, but practically employ in his engines, boilers, and condensers, we should not have made such progress in the economy and portability in our steam-engine practice out of Cornwall as we have since 1843. On referring to the 47 remaining claims found in his six specifications relating to the details of this invention, Mr. Craddock is seen constantly as a practical inventor, who knew what he was about as an engineer.

AN ENGINEER.

* This letter is headed "Dircks's Anti-Explosive Apparatus."

FOREIGN MINES.

NEW WILDBERG.—Z. Walls, June 18: The 20 lachter level, driving west, continues just about the same as last reported, worth about 12 cwts. of silver-lead ore per lachter. The work throughout the mines is proceeding satisfactorily, but we have no change in the value of any of the pitches or bargains for lead or copper ores to mention. The new straking tables will be started to work next week.

NOVA SCOTIA LAND AND GOLD CRUSHING AND AMALGAMATING.—The directors have received by the present mail advices from Halifax, Nova Scotia, intimating the intention of the managing director to remit fortnightly in future alternately from Sherbrooke and Oldham. The manager of Sherbrooke advises a decided improvement in the Scars lead, several droppers from the south having run into the main lode, and increased its size and quality. Others are falling into the lode, leading him to expect a good return of gold from this lead this month. From Oldham the manager says:—"The Wallace claims are looking very well. We have taken during the last two weeks about 20 tons of quartz. They are looking well, and I think promise a very good return."

EAST DEL REY.—Capt. William Treloar, Sabara, May 13: Capao and Emily Mines: The Papa Farinha watercourse, including the tunnel, launders, stands, &c., is, I am glad to say, nearly finished. In a couple of days more I hope the water will be delivered on the mine. The sinking of Henderson's shaft progresses favourably; lode small, but producing good work for the stamps. In extending eastward of stull No. 1, the lode continues to enlarge; at present it is about 7 ft. wide, and presents a promising appearance. The sinking towards leaving a pillar west of Henderson's shaft is being pushed on vigorously. I am glad to say the Hard lode continues to improve, and looks better as we extend more into it. I am in hopes that the stone will yield better at the stamps. At Morro Sao Vicente, considering the few European labourers we have there, we have made excellent progress in the alterations and repairs necessary to the old pumping machinery. If no unforeseen impediment presents itself, everything will be ready in a few days. While the above works are in hand we can do but little towards produce. I must crave your patience till we have put things in order, got the water in fork, and our English force augmented; then I hope to be in a position to send you most cheering reports from the mines.

ST. JOHN DEL REY MINING COMPANY (Limited.)—Advices received June 30, per steamer *Oneida*, from Brazil:—

Morro Velho, April 29.—REDUCTION DEPARTMENT.—Since the date of the last advices from this, the supply of stone from the mines received on the spalling-floors has been inadequate to the stamps consumption; the proportion of ore contained in it has been smaller than usual. We have an ample supply of water, and, therefore, the power of doing large duty, but we have not had the requisite ore to operate on. The spalling, under the circumstances, has been attended with more than the ordinary amount of labour, as the providing hard material for the Praia Works, involved its being entirely selected from the general refuse heap, that received on the spalling-floors having been consumed by the general stamps at Morro Velho. Advantage has been taken of the smaller qunntity of ore now available to have considerable repairs done to the water-wheels and stamps machinery. The amalgamation process has been carried on with the usual regularity and results, though the sand subjected to treatment has not been so rich as heretofore.

PRAIA WORKS.—There has been a full supply of hard material broken at the Morro Velho works and conveyed to the Praia for the re-treatment of the sand by the stamps there, but the quality of it has not been so good as we have been generally able to procure from the depôt. From the ore now reduced in the Morro Velho stamps the sand passing down to the Praia Works cannot be of average quality. There has been an abundant supply of water, and the stamps and arrastres have been kept almost continuously at work, and have been driven at full rates of speed.

MINE.—The native attendance having been very much below the usual average, we are not able to carry on the stoping to the ordinary extent in the mines. Owing to the carrying on of the timberwork in the Bahu, over the opening in the shaft, and the stopes eastward in the meantime not being available for working on, until the timberwork and covering are provided, we cannot expect a full supply of ore from the Bahu Mine, as we cannot find space to employ the borers fully or advantageously for quarrying. The pumping is going on steadily, and an additional amount of new work is being fixed in the Cachoeira Mine, in continuation of the plans in progress for making that pumping more perfect and efficient than it has hitherto been. The construction of the cylindrical drums on the Cachoeira hauling machines is now progressing, and though this prevents hauling by that machine for the time being, still, in the end, we hope this time will be compensated for by the increased efficiency and security from breakage and interruption, which the wire-ropes will afford, and the larger quantity of stone which we expect to haul by that medium when once at work.

WEST QUEBRA PANELLA.—From this section of the mine, having two corps steadily employed in it, we are getting a good supply of ore. The sinking and stoping is going on regularly, and the lode, as opened, continues of the same quality. Increased hauling power will soon be required here.

GOLD EXTRACTED TO DATE.—The produce of the stamps during the second division of April, being a period of 10 days, amounts to 8773 oitavas. It has been obtained as follows:—

	Oitavas.	Tons ore.	Oits. per ton.
From General stamps	4694	from 1125·6	= 4·170
,, Herring stamps (Bahu)	2132	322·4	= 6·612
,, Lyon stamps (Cachoeira)	1947	368·0	= 5·290
Total stamps' produce	8773	1816·0	4·830

When the localities of the mine now being worked are kept in view, and the circumstances that a large proportion of the richest part of the Bahu Mine is not being stoped at present, the produce obtained from the ore treated in the stamps may be regarded as satisfactory. From the gold contents of the ore, as shown by the assays, the recovery in treatment has been good.

Advices received June 20, per French steamer *Guienne, via* Bordeaux:—

Morro Velho, May 17, 1864.—PRODUCE.—The gold return for the month of April, I am sorry to state, only amounts to 27,124 oits. It has been obtained as follows:—

	Oits.	Tons ore.	Oits. p. ton.
From General stamps	15,375	.. from 4125·1	= 3·727
,, Herring (East Bahu)	4,478	645·6	= 6·937 } 4.271
,, Lyon (Mid. and West Cachoeira)	3,832	774·4	= 4·948 }
Total stamps' produce	23,685	5545·1	
Arrastre produce	1,397		=0·256
Total Morro Velho	25,082		4·527
Praia produce, stamps and arrastres	2,042		
Total produce	27,124		

The foregoing produce, compared with previous monthly returns, is very small. Taking into consideration the supply of mineral, and the quantity available for the stamps, it may be regarded as a fair produce from the ore treated. During the first two divisions of the month, the supply of ore was pretty regular, and as large as might be expected from the sections of the mines then available for stoping; but owing to the melancholy occurrence which took place on March 19, and the sudden and general ceasing of the borers from work in the mine from that date until almost to the end of the month, we could not get stone quarried for the stamps to give more than 33 per cent. of the necessary supply of ore, the remainder of the material required for the stamps' consumption, or 67 per cent., having been obtained from the killas heap, close to the spalling-floors. The produce of the last division of the month, being a period of 11 days, was by this means suddenly reduced to 6148 oits., or 559 oits. per diem. We, therefore, had not the ore to reduce, and could not obtain better produce from the quantity of mineral available. The ore was trated separately from the killas, but, from the small quantity received from the mine, we could not keep up the distinction of separations hitherto maintained from the respective sections of the mine shown in the returns.

COST AND PROFIT.—Produce for April .. 27,124 oits.
Less loss in melting ..... 123 oits.

Nett produce ..... 27.001 oits.

At Rs. 3 $500 per oit. = Rs. 94,503 $500 at 2s. 3¼d.	£10,730	1	8
Cost for April Rs. 93,755 $939, at exchange 2s. 3¼d.	10,645	4	1
This leaves a profit on the month's working of	£ 84	17	7

The produce, as previously explained, is small, and the cost, from circumstances we cannot control, is very large. The general prices of articles of consumption are favourable, and rather under the average; so that in provisions there is a little decrease in the monthly outlay. The consumption of timber for the mine is very heavy, and there is a large amount being expended in providing half log timber and 6 inch log planks for covering the back of the Bahu shaft. The outlay for smith and other mechanical work, in connection with the timberwork, is very considerable, so that our cost for the present must necessarily be heavy, and it unfortunately happens that while this work is going on we are precluded from getting at the section of the Bahu, which yields the largest supply of good ore, and hence our very small gold produce, and the merely nominal profit, which is shown in the month's working; the ore, however, is in reserve, and, if all go well, we shall shortly be able to quarry and convey it to the spalling-floors with a less monthly cost than we are now incurring.

REDUCTION DEPARTMENT.—The general duty performed in this department may be seen from the following table:—

Stamps working 30 days, average	131·90 heads.
Ditto 135 heads, average	30·29 days.
Arrastres each has worked, average	26·10 days.
Ditto each produce per diem	3·345 oits.
Ditto produce on that of stamps	5·89 per cent.
Stamp heads produce each per diem	5·790 oits.
The quantity of ore reduced amounts to	5545·0 tons.
The killas conveyed to the Praia works amounts to	1564 tons.
There was also taken from the killas heap	978·0 tons.
The sand amalgamated amounts to	3904 cub. ft.

Which gave a gold return of 6·42 oitavas per cubic foot. The unrecovered gold contents shown in the process of extraction is 25·49 per cent.

During the last division of the month the duty of spalling was augmented by the additional labour of having to bring a considerable portion of the killas in from the heap for the supply of the stamps. The supply for the two previous divisions as received on the floors, though small, was pretty regular, but of inferior quality, being quarried from the slide in the western part of the Bahu, or rather in the East Quebra Panella section of that mine. Some considerable repairs have been effected to the water-wheels and stamping-mills during the month, and the general machinery, excepting when undergoing these necessary repairs, has been kept steadily at work. The amalgamating process has proceeded regularly and satisfactorily, and the supply of water has been ample for all the purposes of the department.

PRAIA.—Notwithstanding the inferior and comparatively poor character of the sand received at these works from Morro Velho, the produce of the month is large and good. The stamps have given 1412 oits., the arrastres 630 oits., making a total of 2042 oits. The arrastre return is only 2 oits. more than the previous month, but that of the stamps exceeds March by 368 oits. There has been some old sand, which was formerly collected as overplus, used during the month both in the stamps and arrastres, and this may, probably, have augmented the gold return a little. The produce, however, is better than might have been expected from the character of the sand received from the general works. The stamps and arrastres have worked regularly, and at full rates of speed.

MINE.—Although we have had a fair attendance of natives in the mine during the first 19 days of the month, yet the small number who worked after that date reduced the average attendance considerably below the medium. The native borers averaged daily 196·08; others, 19·03; together, 215·11. The total average of natives amounted to 302·73; and of others, 470·53; making a total of 773·26. Thus the average daily attendance of April is upwards of 111 less than we had in March. This was entirely caused by the decrease of the attendance after the 19th. The number of wagons of stone quarried and conveyed to surface amounts to 6840, or equal to 31·79 wagons per borer employed, which is very good duty.

In the CACHOEIRA MINE the sinking of the sump has only amounted to 1 ft. vertically, owing to the increased quantity of water conveyed through the pump from the lowe part of the Bahu being drained into the Cachoeira Mine, and thence conveyed to No.

plunger in the Bahu. The stoping throughout this mine is being carried on regularly and actively, though the force employed in it is not large. One new shaft piece has been put in, eight new rollers and ten sets of stays, and four runners provided and put in for the new plunger about to be put in. A pillar of six logs of timber has been put in near the stopes, and 14 logs put in for supporting the walls at the Middle Cachoeira, and five pieces of timber added at No. 6 stull.

In the BAHU six shaft-pieces have been put in, and thirty-nine runners, forming the new bed of the shaft; four back pieces are now in—only one more is required to complete the cross timber of the new portion of the shaft. A considerable quantity of log-timber, prepared as runners, half-timber and as 6-inch plank, has been used, and more is still required of the same kind, for the covering of the back of this shaft. The stull No. 6 is being extended, two logs having been put in, and thirty-three runners for this purpose. New cross-pieces are being provided for the support of No. 5 plunger, and other preparations are well forward for the new pit-work about to be provided, and fixed from this point down to the sump. The timber-work in the shaft is going forward steadily and as speedily as practicable, keeping in view the safety of the people employed, and that the work should be well done.

At the EAST QUEBRA PANELLA platforms and breastwork of timber have been provided and fixed, with the view of stoping down the mineral left westward of the slide, and thus bringing these westward stopes of the Bahu within the range of working with the eastern parts, when the stoping is resumed there. There is a large quantity of timber now being used in the Bahu, and, consequently, the hauling-machine is frequently used for this purpose, the western kibble only being employed in hauling stone from the stopes.

WEST QUEBRA PANELLA.—The sump has been sunk 1 ft. vertically, and the end driven 3 feet westward. No change observable in the appearance or quality of the lode. The supply of stone from this section has been good and regular during the month.

GOLD EXTRACTED TO DATE.—The produce of the stamps for the first ten days of May has only amounted to 4059 oits. No separation of the sections being practicable, owing to the very limited quantity of ore received during that period from each, one incline only has been hauling stone from the western part of the Bahu, and the Cachoeira machine has been a good deal occupied in getting on the work for the wire-rope, so that we have not had nearly our ordinary supply of ore from the Cachoeira Mine.

CACHOEIRA HAULING-MACHINE.—A new drum of 15 feet in diameter has been provided and fixed on the hauling-wheel for the purpose of working Walker's incline plane with wire-rope, as the diameter of this hauling circle is much larger than any hitherto in use here, it was considered desirable to try the wheel as to its power of hauling with this increased diameter before entirely removing the chain arrangements from Walker's line. The wire-rope belonging to Edwards's line (East Cachoeira, usually work by the Gamba machine) was attached to the drum of the Cachoeira hauling-machine wheel, and the trial so far proved in every respect satisfactory. A second drum, 13 ft. 6 in. in diameter, is quite ready for attaching to the wheel for working Hope's incline, and some of the pulley-frames are already fixed for carrying the wire-rope to the top of the incline plane at the mouth of the Cachoeira shaft. The work is going on at intervals as the machine can be taken, and will in a very short time be completed, should no unexpected interruption arise. It will be a great advantage to our hauling in the Cachoeira when we get these wire-ropes brought fairly into use.

LUSITANIAN.—June 11: Palhal Mine—Basto's Lode: The lode at Taylor's engine-shaft, below the 80, is 4 ft. wide, composed of quartz and copper ore, worth for the latter 3 tons per fm. River shaft is down to the 70, and the men have begun to drive west. In the 70, west of River shaft, the lode is worth 1 ton per fm. The plat in the 50, at Oak shaft, is complete, and the men have commenced driving the 50 cross-cut south, where the ground is of a hard gneiss. The lode in the 80, east of Taylor's, has been disordered by the caunter lode passing through it, and is now very irregular, but producing stones of ore. In the 80, west of Taylor's, the lode is composed of quartz and flookan. In the winze below the 70 the lode is 1 ft. wide, worth 1 ton per fathom. The lode in the 70, east of Taylor's, is worth ¼ ton per fm. In the 70, west of Taylor's, the lode is worth 1 ton per fathom. In the 60, west of Taylor's, the lode is worth 1 ton per fm.; here the mill lode is joined with the slide lode. In the 60 cross-cut, north of River shaft, the ground is of hard gneiss. In the 50, west of slide lode, the lode is just small strings, and all poor, with hard ground. The lode in the 50, west of Taylor's, is 2 ft. wide, composed of flookan. The caunter lode has left the slide, and gone off in in the north side. The lode in the 38, west of slide lode, is 1½ ft. wide, composed of quartz, and stones of lead and copper. In the 28, west of Perez' shaft, lode 1 ft. wide, composed of quartz and ore, worth for the latter 1 ton per fm.; this improvement took place in the lode, which was taken down on the 10th inst. The lode in the 18, west of Perez shaft, is small and poor. In the 8, west of Perez shaft, the lode is 1¼ ft. wide, going west, but is suspended for the present, and we are driving east on a branch that came into the lode from the south side, which is 8 inches wide, and worth ⅛ ton per fathom. —Caunter Lode: In the 60, east of slide lode, the lode is 1¼ ft. wide, composed of quartz, lead, and copper. The rise above the 60 is holed to the 50, and the men put to stope. In the 50, east of Machado's winze, the lode is worth ¼ ton per fathom. In the 50, west of Machado's winze, the lode is worth ⅛ ton per fathom. The lode in the 28, west of Mill lode, on the slide lode, is 1 ft. wide, yielding stones of ore.—Stopes on Basto's Lode: The stope, west of Perez shaft, above the adit, is worth ⅛ ton per fathom. The stope between the 8 and the adit is worth 1 ton per fm. The stope between the 50 and 38 is worth 2 tons per fathom. The stope between the 70 and 60 is worth 1 ton per fathom. The stope between the 60 and 38 (Mill Lode) is worth 1 ton per fathom. We have commenced a new stope between the 60 and 50, where the lode is worth 2 tons per fathom. In the stope above the 70, west of Nunes' winze, the lode is worth 1 ton per fathom.—Carvalhal Mine: In the adit, west of incline shaft, the lode is 3 feet wide, composed of quartz and spots of lead. The lode in the adit, east of the River Caima, is 6 inches wide, composed of rusty spar. In the adit, west of the River Caima, we are cutting south to find the south part of the lode.

EAST KONGSBERG.—D. T. Macdonald, June 3: South Ramsrud: I stated in my last report that, on account of the great underlie of the fahlbands to the east in this mine, it would be necessary to drive a small level east, so as to open up stoping ground in that direction I have now to state that we began to drive this level on Monday last, and from the improved appearance of the vein we feel confident that we shall soon come into productive ground again. During the past week this vein has yielded a small quantity of native silver.—Middle Ramsrud: The vein in this mine still averages 3 in. in width, and at present only shows traces of silver.—North Ramsrud: We have suspended this mine in the meantime, and removed the men to drive the above mentioned in the last level in South Ramsrud.—Neuse Glues: The driving of this adit is being pushed on night and day; the progress making is about 2 feet per week, and this by powder.—Stamping: We shall prepare next week for stamping our ores in the following week.

— June 10: South Ramsrud: The vein in this winze averages 4 in. in width; it is at present rather poor, but continues to give a little native silver daily in the eastern end of the gasenk. We hope, when we have opened up the ground to the east, where the fahlbands are very strong, that the vein will show an improvement.—Middle Ramsrud: The vein in this mine is without any improvement, only showing traces of silver.—Neues Gluck: The adit has been driven 0·68 fathoms, by four men, driving by powder; the present end is being driven on the course of the fahlband, but the strongest fahlband upon which the mines were formerly sunk has not yet been cut by the adit.

VAL TOPPA.—W. Harris, T. Roberts, June 18: The gold produce of the Val Toppa Mines for the past month has been forwarded to the office in a box containing an ingot weighing 3534 grammes, equal to 114 ozs. of fine gold, and obtained from average ore. The produce for June will be equal, if not superior, to that of May. I enclose Capt. T. Roberts's report:—"We are happy to inform you that the produce of May, being 114 ozs. of gold, continues to prove the value of these mines. The native mills are all working, and a similar remittance of gold will be continued regularly. The discovery in the back of Marmo Rosso level, which you will please to understand is in virgin ground, has increased the value of the mine very much indeed. We have cut through the lode, which is found now to be 12 ft. wide, very rich gold ore, producing more gold than the average ore. The tramways in the principal levels are fast being completed, the barracks at the mine are finished, the cart-road from the mine to the new establishment will be finished during this summer, and the water-course for the new establishment is now under construction. These mines continue to be all that can be desired. The gold produce leaves a handsome profit on cost of same, and we have a great future before us."

VALLANZASCA.—T. Roberts, J. Roberts, June 17: The enclosed report from the captains of the mine will inform you of our progress underground, and in the construction of the establishment. During this month I intend to smelt and forward the amalgam now being obtained at Battigio. The Cava Vecchia level has been communicated with the Cavetta level, laying open a large quantity of rich auriferous ore; the tramway in the Cava Vecchia level is now being lengthened to reach the above. The tramways in Piazza Nuova and the Albasini levels have been completed, and are now in communication with the shoots. The cross-cut driven east in Mazzeria level has cut the Yellow lode, which has never been seen at t this depth before, but has produced very rich gold ore in the upper levels. The lode continues to yield good ore, but we expect a great improvement here in driving further on. The lode in the Sasso Nero, at the bottom, is very rich, yielding ore containing more than 5 ozs. of gold per ton. At the establishment we are running a small number of native mills, and shall smelt the amalgam during this month; the yield of ore is still an average of ¼ oz. of gold per ton. The construction of the new works has progressed as follows since our last report:—The pieces of the bed-stones for 25 new mills are completed, and are now being fitted together, and 15 more will immediately follow. The crusher is being put up. The pillars for sustaining the upper floors in the mill-house being built, the great wheel we hope to have in its place during next month. Three of the new mills will be in working condition before the end of this month.

VICTOR EMANUEL.—Pallanza, June 18: The manager writes—I enclose the report of the captain on our Miggiandone, Baveno, and Crodo Gold Mines, which I hope you will find satisfactory. The Crodo Mine continues to give us great hopes of riches under the old workings. The old shaft, as you will find from the report, is now being drained, and the arches of lode left by the old men are found to contain very rich gold ore. Some splendid specimens have been brought to me during last week. Our prospects underground are as follows:—In the end of Falconer's level the lode is 3 feet wide, with good stones of ore; the stopes at present poor. In the end of Thompson's level the lode is 4 ft. wide, yielding good stones of ore. In the old stopes, in bottom of this level, the lode is 5 ft. wide, worth 12*l.* per fm. In the new stopes, in bottom of the same level, the lode is 6 ft. wide, worth 12*l.* per fm. In Clinton's level (new winze) the lode is 3 ft. wide, worth 6*l.* per fm. The stopes in the side and bottom are worth 10*l.* per fathom. The progress of our surface operations has been satisfactory. All the principal walls of the water reservoir are finished. We have tried the crusher, and found it to work well.—Baveno Mine: Underground Operations: In the Cava Vecchia bottom the north lode is 3 ft. wide, composed of quartz and copper ore, worth 10*l.* per fm. In the 50 metre level the cross-cut west has reached the side lode, but is not through it yet. In the stopes in back of the 35 metre level, south of shaft, on side lode, the lode 2 feet wide, worth 6*l.* per fathom. The cross-cut from new shaft, to intersect the Cava Vecchia lodes, looks promising for the lode being rich when we cut it. The winding machinery for this shaft is now being put up.—Victor Emanuel Level: We have a very large lode here; the orey part of it is 3 ft. wide, and worth at least 10*l.* per fm. We have commenced a stope in back of this level.—Crodo Gold Mine: The surface water in the deep adit has all been taken up. We have now commenced to drain the old shaft and workings under the adit, which are very long, and have already done so for 14 metres in depth. We find the gunnies of the lode about 4 ft. wide, carrying regular walls. The lode, where left by the old men, contains rich ore. The lode, in sinking on the new discovery, continues to yield good ore. We have completed six small native mills, and shall commence next week to amalgamate with them on a small scale, but hope that the time is not far distant when the prospects of the mine will induce you to commence the construction of a regular and large amalgamating establishment.

A MOUNTAIN OF PRECIOUS STONES IN SIAM.—In the mountains of Chantaboun, and not far from my present abode, precious stones of fine water occur. There is at the east of the town an eminence, which they call "the mountain of precious stones;" and it would appear from the account of M. Pallegoix that at one time they were abundant in that locality, since in about half an hour he picked up a handful, which is as much as now can be found in a twelvemonth, nor can they be purchased at any price.—*Mouhot's Travels in Indo-China.*

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